

DISCIPLINE SPECIFIC ELECTIVE COURSE – DSE 10: MICROPROCESSOR

Course Title & Code	Credits	Credit distribution of the course			Eligibility Criteria	Pre-requisite of the course
		Lecture	Tutorial	Practical		
Microprocessor DSE – 10	4	2	0	2	Class XII pass with Physics and Mathematics as main subjects	Basics of Digital Electronics

LEARNING OBJECTIVES

Students will be able to outline the types and the functions of storage, learn the characteristics of RAM and ROM and their architecture, describe the architecture of 8085 microprocessors and develop programs for microprocessor 8085

LEARNING OUTCOMES

At the end of the course, students will develop ability to,

- Define storage state the types and functions of storage
- Describe the characteristics of RAM and ROM and their architecture.
- Describe memory organization, addressing, interfacing and mapping
- Describe the architectures of 8085 microprocessors
- Draw timing diagram
- Write programs using 8085

SYLLABUS OF DSE - 10

THEORY COMPONENT

Unit – I - Introduction to 8085 Microprocessor Architecture (16 Hours)

Introduction to microprocessor: Basic computer system organization, introduction, classification and applications of microprocessors, types of memory-primary memory types (SRAM, DRAM, PROM, EPROM, EEPROM), secondary memory (SSD, Optical Drive) memory organization and addressing

Microprocessor 8085 Architecture: Features, architecture-block diagram, general purpose registers, register pairs, flags, stack pointer, program counter, types of buses, multiplexed address and data bus, generation of control signals, pin description of microprocessor 8085, basic memory interfacing concepts, Memory mapped I/O and I/O mapped I/O.

Unit – II - 8085 Programming (14 Hours)

Operation code, operand and mnemonics, instruction set of 8085, instruction classification, addressing modes, instruction format, data transfer instructions, arithmetic instructions, increment & decrement instructions, logical instructions, branch instructions and machine control instructions, subroutine, call and return instructions, timing diagrams-instruction cycle, machine cycle, T- states, basic idea of interrupts, assembly language programming examples (addition with and without carry, subtraction with and without borrow, double addition, multiplication by repeated addition, division by repeated subtraction, block data

transfer and checking of parity of a binary number)

References:

Essential Readings:

- 1) Microprocessor Architecture Programming and applications with 8085, R. S. Gaonkar, 2002, Prentice Hall
- 2) Microelectronic Circuits, S. Sedra
- 3) Fundamentals of Microprocessor and Microcomputer, B. Ram, Dhanpat Rai Publications
- 4) The Intel Microprocessors - Architecture, Programming and Interfacing, B. Brey, 2003, Pearson Education

Additional Readings:

- 1) Microprocessors and Microcontrollers, M. Ali Mazidi, 2006, Pearson

PRACTICAL COMPONENT

(15 Weeks with 4 hours of laboratory session per week)

At least six experiments to be performed from the following list.

8085 Assembly language programs

- 1) Add two 8-bit numbers using Direct and Indirect Addressing Mode
- 2) Subtract two 8-bit numbers using Direct and Indirect Addressing Mode
- 3) Multiply two 8-bit numbers with and without subroutine
- 4) Divide two 8-bit numbers with and without subroutine
- 5) Add a list of 8-bit numbers
- 6) Transfer a Block of Data
- 7) Add two 16 bit numbers with DAD and without DAD
- 8) Convert byte to Nibble
- 9) Convert nibble to Byte
- 10) Check the parity of a given number

References for laboratory work:

- 1) Microprocessor Architecture Programming and applications with 8085, R. S. Gaonkar, 2002, Prentice Hall
- 2) Microelectronic Circuits, S. Sedra
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